CLEARWATER
GROUP
Environmental Services

FILE

2 May 2005

Ms. Joan Fleck
Associate Engineering Geologist
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

Re: Groundwater Monitoring Report – Second Quarter 2005
421 Santa Rosa Avenue
Santa Rosa, CA
Case No. 1TSR059
Clearwater Group Project No. AB021C

Dear Ms. Fleck:

Clearwater Group (Clearwater) has prepared a second quarter 2005 groundwater monitoring report for the subject site. The report includes background information, groundwater monitoring activities, groundwater monitoring results, conclusions, recommendations, and planned activities.

BACKGROUND

Site Description

The site is located on the northwest corner of Santa Rosa Avenue and Sebastopol Avenue in Santa Rosa, Sonoma County, California (Figure 1). It is set in an area of combined residential and commercial uses. Regional topography slopes gently toward the west. A former service station building exists on-site and is currently used as an automobile repair shop. An additional on-site building is currently used as a Greyhound Bus terminal. A site plan is shown in Figure 2.

Underground Storage Tanks Removal History

In July 1988, the underground storage tanks (USTs) were removed from the site. Three 10,000-gallon gasoline USTs were removed from a common excavation in the southern portion of the site, and one 550-gallon used oil UST was removed from another excavation in the western portion of the site (Figure 2). Associated product dispensing / vent lines and fuel dispensers were also removed. Analytical results for soil samples collected from beneath the USTs during removal indicated elevated concentrations of petroleum hydrocarbons.

Corrective Action History

Harding Lawson and Associates (HLA) of Novato, California conducted a site investigation in 1989. HLA performed a preliminary site assessment with hand-augered shallow boreholes (B-1 though B-13) in locations near the former USTs and dispensing lines (Figure 2). The results of HLA's work were presented in their report dated April 24, 1989.

GeoPacific Investigations (GPI) of Novato, California installed three monitoring wells (MW-1 through MW-3) and drilled three additional soil borings (SB-1 through SB-3) in September 1991 (Figure 2). Results of this work were presented in GPI's Report for an *Initial Hydrogeologic Investigation for an Unauthorized Release of Petroleum Constituents* dated May 8, 1992.

GPI drilled additional soil and hydropunch borings (SB-14 though SB-28) in September 1994 to further characterize the extent of soil and groundwater contamination. Results of this work were presented in GPI's *Subsurface Soil/Groundwater Investigation* report dated September 22, 1994.

GPI directed excavation of contaminated soil in the area of the former USTs and dispensers during site remodeling efforts in 1996. During construction of a new Greyhound terminal in early 1996, crews encountered older dispenser lines and contaminated soil in the vicinity of the former southern dispenser island (Figure 2). Based on these observations, the Santa Rosa Fire Department requested removal of the lines and over-excavation of any associated contaminated soil. In February and May 1996, GPI supervised the over-excavation of approximately 400 cubic yards (cu. yd.) of soil from this area. The excavation did not extend deeper than 5 feet below ground surface (bgs). Approximately 250 cu yd of soil were transported to Redwood Landfill in Novato, California for disposal and the remaining 150 cu yd were aerated on-site to non-detectable concentrations of gasoline hydrocarbons, and then used as excavation backfill. Results of this work were presented in GPI's Report for *Over-excavation of Petroleum Hydrocarbon Contaminated Soils* dated August 14, 1996.

Additional over-excavation activities were performed in late 1996. GPI supervised the excavation of approximately 1,000 to 2,000 cu yd of additional soil. The maximum depth of the excavation was between 5 to 7 feet bgs. The work was performed in six phases consisting of excavation and aeration of approximately 150 to 200 cu yd at a time. Excavated soil was aerated between 4 and 7 days prior to confirmation sampling. Nearly all of the excavated soil was used as backfill following aeration. Approximately 300 to 400 cu yd of surplus excavated soil was transported to Redwood Landfill for disposal. Results of this work were presented in GPI's report for *Additional Over-excavation of Petroleum Hydrocarbon Contaminated Soils* dated November 11, 1996.

In May 2000, Clearwater oversaw the proper destruction of wells MW-1 and MW-2, which had been damaged during excavation and site redevelopment work. Well MW-3, also damaged and covered during site work, could not be located. Clearwater supervised the installation of two replacement wells (MW-1A and MW-2A), and four additional plume delineation wells (MW-4 through MW-7). Results of these efforts were presented in Clearwater's *Additional Subsurface Investigation Report* dated May 31, 2000.

In December 2000, Clearwater supervised the installation of two additional downgradient plume delineation wells (MW-8 and MW-9). Results of these efforts were presented in Clearwater's *Problem Assessment and Groundwater Monitoring Report (Fourth Quarter 2000)* dated December 29, 2000.

Well construction data for all the available monitoring wells of the site is listed in Table 1.

Hydrogeology

The site is underlain predominantly by clay to a depth of approximately 17 feet bgs. A sand layer underlies the clay to a depth of approximately 20 feet bgs. Depth to groundwater has historically ranged from approximately 5 to 14 feet bgs, with flow toward the northwest and north-northwest.

Petroleum Hydrocarbons of Concern

The predominant petroleum hydrocarbons, which appear to have been released to the subsurface from the former UST system, consist of gasoline compounds. Specific compounds or compound groups, which have been consistently detected, include total petroleum hydrocarbons as gasoline (TPH-g), and benzene, toluene, ethylbenzene, total xylenes (BTEX). A maximum methyl tertiary butyl ether (MTBE) concentration of 44 micrograms per liter (µg/L) has been detected by EPA Method 8260B in monitoring well MW-9 when it was sampled on January 8, 2003.

Distribution and Mass of Sorbed-Phase Petroleum Hydrocarbons

The extent of residual sorbed-phase hydrocarbons has been determined. The "footprint" of sorbed-phase hydrocarbons resembles an ellipse, elongated toward the south. The lateral extent of sorbed-phase hydrocarbons appears to be restricted to just beneath the subject property. Sorbed-phase hydrocarbon concentrations appear to be greatest at the average depth of the capillary fringe (i.e., approximately 7.5 to 10 feet bgs). However, the total thickness of soil containing residual hydrocarbons ranges from approximately 7.5 to 15 feet bgs, with a shallower soil pocket present beneath the service bay building from approximately 5 to 15 feet bgs.

The total volume of soil impacted by TPH-g concentrations greater than 10 milligrams per kilogram (mg/kg) is estimated at approximately 63,000 cubic feet (cu ft) (or 2,300 cu yd) in-situ. This impacted soil volume contains approximately 1,716 pounds or 280 gallons of gasoline hydrocarbons.

Distribution and Mass of Dissolved Petroleum Hydrocarbons

The extent of the high concentration dissolved-phase hydrocarbons plume coincides with the general "footprint" of sorbed-phase hydrocarbon residues; but the edges of the dissolved-phase plume are more widespread. Maximum TPH-g and benzene concentrations detected in existing on-site wells have been 86,000 µg/L and 17,000 µg/L, respectively, in monitoring well MW-1A as sampled on May 18, 2000.

It is estimated that approximately 520,000 gallons of groundwater are affected by TPH-g with concentrations greater than 100 μg/L, i.e., on the order of 26 pounds (or 4 gallons) of gasoline hydrocarbons reside in the dissolved-phase.

GROUNDWATER MONITORING ACTIVITIES

Groundwater Gauging, Purging, and Sampling

On 13 April 2005, Clearwater monitored all the eight existing monitoring wells (MW-1A, MW-2A, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9). An electronic water level indicator accurate to within ±0.01 feet was used to gauge the depth to groundwater in the monitoring wells, which were also monitored for the presence of Light Non-Aqueous Phase Liquids (LNAPL) prior to purging. No measurable thickness of LNAPL was observed in the wells. All work was performed in accordance with Clearwater's Field Protocols (Appendix A). The wells were purged of groundwater until the quality parameters of temperature, pH and conductivity stabilized, which occurred by approximately three wetted casing volumes.

Following recovery of water levels to at least 80% of their static levels, groundwater samples were collected from the monitoring wells using disposable polyethylene bailers. Samples were labeled and documented on a chain-of-custody form, and placed on ice in a cooler for transport to the project laboratory. Purging devices were decontaminated between wells in an Alconox® wash followed by double rinsing in clean tap water to prevent cross-contamination. Purged water and rinseate was stored in a labeled 55-gallon drum pending future disposal. The drum was immediately removed from the site after monitoring activities for this quarter. It will be sent to the InStrat water treatment facility in Rio Vista, pending acceptance.

Dissolved Oxygen, ORP, Total and Ferrous Iron Field Testing

Following well purging, Clearwater also monitored dissolved oxygen (DO) and oxidation-reduction potential (ORP) using pre-cleaned down well probes; and collected water samples for in-the-field iron testing (total iron, and ferrous iron) using portable iron test kits.

Laboratory Analyses

Kiff Analytical LLC (Kiff), a state-certified laboratory in Davis, California, analyzed the groundwater samples for TPH-g, BTEX, and MTBE by EPA Method 8260B. In addition, Kiff analyzed a sample from MW-1A for 1, 2-Dichloroethane (1, 2-DCA) by EPA Method 8260B.

GROUNDWATER MONITORING RESULTS

Groundwater Elevation and Flow

Measured groundwater elevations in this quarter are listed in Table 2. Depths to water ranged from 3.67 feet to 7.74 feet bgs. Measured depth to water data combined with top of casing elevation data were used to generate a groundwater elevation contour map (Figure 3.) Similar to

the groundwater elevation contours obtained from the first quarter 2005 monitoring, current groundwater elevation contours indicate that the predominant groundwater flow on the site is in the north-northwest direction. The calculated maximum hydraulic gradient on the site on 13 April 2005 was approximate 0.02 ft/ft (refer to Figure 3 for an illustration of interpolated groundwater elevation contours), which was identical to the gradient determined for the first quarter 2005 monitoring event. Groundwater flow determined during the current monitoring period is similar to the first quarter 2005 flow with a minimum groundwater elevation observed in well MW-9.

Groundwater Analytical Results

TPH-g and BTEX were primarily detected in wells MW-1A, MW-2A, MW-4, and MW-5 in this quarter. The detected maximum concentrations of TPH-g and benzene were 23,000 µg/L and 680 µg/L, respectively, in wells MW-1A and MW-4. Figure 4 provides an illustration of TPH-g iso-concentration contours, which are based on the analytic results from this monitoring event. Significant benzene concentration was only detected in MW-1A, MW-2A, and MW-4. Although benzene concentration in MW-1A has been reduced from 820 µg/L to 380 µg/L, the location with maximum benzene concentration was shifted from MW-1A to MW-4 (Figure 4.). Samples from MW-6 through MW-9 were free of detectable benzene concentrations.

Other BTEX compounds were detected in samples from MW-1A, MW-2A, MW-4, and MW-5 Maximum concentrations of toluene (70 µg/L), ethylbenzene (1,300 µg/L), and total xylenes (2,200 µg/L) were detected in well MW-1A. MTBE was detected at concentrations ranging from 1.3 µg/L to 13 µg/L in wells MW-4, MW-7, MW-8, and MW-9. The analyte 1, 2-DCA was analyzed in the sample from well MW-1A only. Its concentration was below the method reporting limit of 1.0 µg/L.

Contaminant concentrations detected this quarter generally fall within historically and seasonally observed ranges, with continuation of overall decline. Elevated levels of TPH-g and benzene continued to be detected in on-site monitoring wells MW-1A, MW-2A, MW-4 and MW-5. Based on the location of former contaminant sources on site and consistent groundwater flow toward the north-northwest, petroleum hydrocarbons in the area of MW-4 and MW-5 are interpreted to be the result of off-site sources (refer to Figure 4 for an illustration of interpreted contaminant distribution and monitoring well locations). Although generally a low level of MTBE was found in wells MW-4, MW-7, MW-8, and MW-9 in the past, MTBE concentration in MW-8 increased from 2.2 µg/L to 6 µg/L. Concentration of MTBE in MW-9, however, was reduced from 20 µg/L to 13 µg/L.

Cumulative groundwater analytical data are also summarized in Table 2. Complete laboratory reports and the chain-of-custody record are included in Appendix B.

Empirical Determination of Contaminant First-Order Degradation Rates

If biodegradation is occurring within a plume, a reduction of hydrocarbons concentrations or mass is usually observed over time. It usually occurs at a site, which has experienced source removal and/or some active remediation. If biodegradation occurs, the rates actually overtake the rate at which petroleum hydrocarbons released from the sorbed-phase into the dissolved-phase. The process that hydrocarbons degrade often takes place at a first-order kinetics. First-order degradation rate can be determined by evaluating the change of either hydrocarbon concentrations from individual wells or total plume mass with time if the plume has been delineated. First-order degradation rates for the petroleum hydrocarbons beneath this site were estimated by using historical monitoring data obtained from well MW-1A, which has the highest TPH-g concentration observed compared with other wells.

Analyzed concentrations of TPH-g and benzene within MW-1A were plotted against time as a semi-log function. A degradation rate was determined by fitting a first-order kinetic equation to the plotted data. The method indicates that the plotted data are highly correlated with the first-order kinetic equation, with correlation coefficient values of 0.96 and 0.93, respectively, for benzene and TPH-g. The estimated first-order degradation rates for TPH-g and benzene in MW-1A are 0.061 per day and 0.155 per day, respectively. The results are presented in Figure 5.

EVALUATION OF MONITORED NATURAL ATTENUATION

Natural attenuation of dissolved hydrocarbon plumes may includes the following processes: biodegradation, volatilization, dispersion/advection, and sorption[1]. Although all of these processes contribute to the change of dissolved constituents within the plume, not necessarily removal of contaminant mass from the plume, only biodegradation process was examined for this site because it seems to be the most dominant process that has the greatest potential for site closure applications using enhanced bioremediation or Monitored Natural Attenuation (MNA).

Biodegradation Processes and Related Indicators

During biodegradation, microbes utilize electron acceptors to oxidize hydrocarbons to carbon dioxide and water; and support the growth of cells. In aerobic degradation, the electron acceptor is dissolved oxygen (DO). In anaerobic degradation, compounds other than oxygen are used as electron acceptors. The reactions that yield higher energy take precedence over those that yield lower energy. This results in electron acceptors being consumed in the following preferential order: oxygen, nitrate, ferric iron, sulfate, and carbon dioxide (methanogenesis). Since oxygen and nitrate are toxic to sulfate-reducing organisms, sulfate cannot be used as an electron acceptor until oxygen and nitrate have been sufficiently depleted[2]. Metabolism through iron reduction uses ferric iron oxides and produces ferrous iron (dissolved) as a by-product.

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[1]McAllister, P.M. and Chiang, C.Y., 1994. "A Practical Approach to Evaluating Natural Attenuation of Contaminants in Ground Water." In *Ground Water Monitoring and Remediation,* Spring 1994.

[2]Wiedemeier, T.H., Wilson, J.T., Kampbell, D.H., Miller, R.N. and Hansen, J.H. (1995). Technical Protocol for implementing Intrinsic Remediation with Long-Term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater. Vol 1. AFCE, Technology Transfer Division, Brooks AFB, San Antonio, TX.

ORP is a measure of the electron activity in a solution. As electron acceptors are consumed within the plume during biodegradation, ORP will drop within the plume as well. Each biochemical pathway has an associated range of ORP values influenced by the influx of electrons to the system. ORP values can, thus, be used to evaluate the active biochemical pathway(s) using electron acceptor depletion as a basis. Alternatively, when electron depletion data is inconclusive, biodegradation will be confirmed and the active biochemical pathway assessed by evaluating ORP values only.

Results of Dissolved Oxygen, ORP, and Total and Ferrous Iron Field Testing

An MNA study was previously performed and reported in the fourth quarter 2004 groundwater monitoring report. The study focused on aerobic and anaerobic biodegradation processes. The results of this study indicate that both aerobic and anaerobic biodegradation processes are occurring within the contaminant plume. The highest concentrations of "hydrocarbon degraders" (both aerobic and anaerobic) occur at MW-1A, where hydrocarbon concentrations are highest. Meanwhile, on the aerobic end, the lowest total bacterial count (by more than an order of magnitude compared to MW-7 and MW-9) occurs at MW-1A. This suggests that anaerobic process probably dominates within the plume. Oxygen depletion would be expected.

DO level seem to be stabilized because the field-measured DO level across the plume for this quarter is similar to what observed in the first quarter 2005. Both the first and second quarter 2005 measurements show that oxygen level reduction occurred compared with the fourth quarter 2004 data. The most noticeable change occurred in wells MW-8 and MW-1A. DO concentration in down gradient well MW-8 dropped from 6.6 mg/L in September 2004 to 0.6 mg/L in January 2005 and 0.1 mg/L in April 2005. Similarly, DO concentration in well MW-1A near the center of the plume dropped from 1.0 mg/L in September 2004 to 0.1 mg/L in January and April 2005.

ORP measured in this quarter ranges from 34 millivolts (mV) in MW-6, MW-9, MW-2A to 42 mV in MW-4. Although current ORP level is generally consistent with the one measured in the fourth quarter 2004 (between +15 to +63 mV), the range is narrower. This may indicate that the oxidation-reduction level is more homogeneous across the plume. Because ferrous iron exists in the reduced state, higher ferrous-iron to total iron ratio may indicate the existence of anaerobic conditions. Within this quarter, total iron concentrations range from 0.0 mg/L in MW-7 and MW-8 to 3.6 in MW-2A. Ferrous iron ranged from 0.0 mg/L in MW-6 through MW-9 to 2.0 mg/L in MW-2A. The resulted ferrous-iron to total iron ratio ranges from 25% to 56% in wells MW-1A, MW-2A, MW-4 and MW-5, where hydrocarbon concentrations are higher. The ratio for these four wells ranged from 61% to 93% in the fourth quarter 2004. The data suggests that total available iron in groundwater has been reduced. As a result, potential for anaerobic degradation through iron reduction may have reduced. The DO, ORP, total iron, and ferrous iron data measured in this quarter are listed in Table 3.

CONCLUSIONS

- Although groundwater elevation across the site dropped from 0.23 ft (MW-2A) to 1.43 ft (MW-9) during this monitoring event compared with the first quarter 2005 data, both groundwater flow direction and hydraulic gradient were similar to the first quarter 2005 observation.

- Although groundwater elevation dropped during this monitoring event compared with the first quarter 2005 data, both TPH-g and BTEX concentrations remained less than the method reporting limits in cross gradient and down gradient wells MW-6 through MW-9.

- Level of groundwater impact across the site seems stabilized. Both TPH-g and benzene concentrations were similar to those observed in the first quarter 2005. Maximum TPH-g and benzene concentrations of 23,000 µg/L and 680 µg/L were detected in wells MW-1A and MW-4, respectively.

- Concentration of MTBE in down gradient wells MW-7 through MW-9 remained relatively stable during this quarter.

- Presumed biodegradation of hydrocarbons that typically causes oxygen depletion has been observed in wells MW-1A and MW-8. Groundwater monitoring also shows low DO concentration and low ORP on site.

- First-order degradation for TPH-g and benzene likely exists on-site. The estimated first-order degradation rates for TPH-g and benzene in MW-1A are 0.061 per day and 0.155 per day, respectively, which are consistent with the rates estimated in the first quarter 2005.

- Both trend of concentration change over time and measured MNA parameter values suggest that degradation may exist on site under anaerobic condition. However, based on the change of TPH-g concentration near the center of the plume as well as the observed MTBE level down gradient, the plume seems stabilized.

RECOMMENDATIONS

- Quarterly groundwater monitoring and measurement of MNA indicators including DO, ORP, total irons, and ferrous irons should continue prior to the site remediation.
- Because plume seems stabilized under anaerobic condition, and both TPH-g and benzene levels are still relatively high near the center of the plume, enhanced biodegradation should be considered prior to significant off-site migration of hydrocarbons and MTBE occurs.

PLANNED ACTIVITIES

Given the low-permeability sediments identified on site based on the 31 August 2004 SVE pilot test results, a variety of in-situ remediation technologies, which do not require high-permeability

soils to be effective, including oxygen delivery systems, have been evaluated to enhance aerobic biodegradation of hydrocarbons by indigenous microbes. The evaluation results were presented in the *Corrective Action Plan Addendum* (CAP Addendum) dated 17 February 2005. The regulatory review comments for the CAP Addendum also have been received on April 12, 2005. Based on the approach proposed in the CAP Addendum and review comments, an interim remedial investigation including background level geochemical sampling will soon begin. The investigation results will constitute the basis for the preparation of the Remedial Action Plan (RAP).

CERTIFICATION

This report was prepared under the supervision of a professional State of California Registered Geologist at Clearwater Group. All statements, conclusions and recommendations are based solely upon published results from previous consultants, field observations by Clearwater Group, and laboratory analysis performed by a California DHS-certified laboratory related to the work performed by Clearwater Group.

Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.

The service performed by Clearwater Group has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Best regards,
Clearwater Group

Jim Ho, Ph.D., P.E., CGWP
Principal Engineer

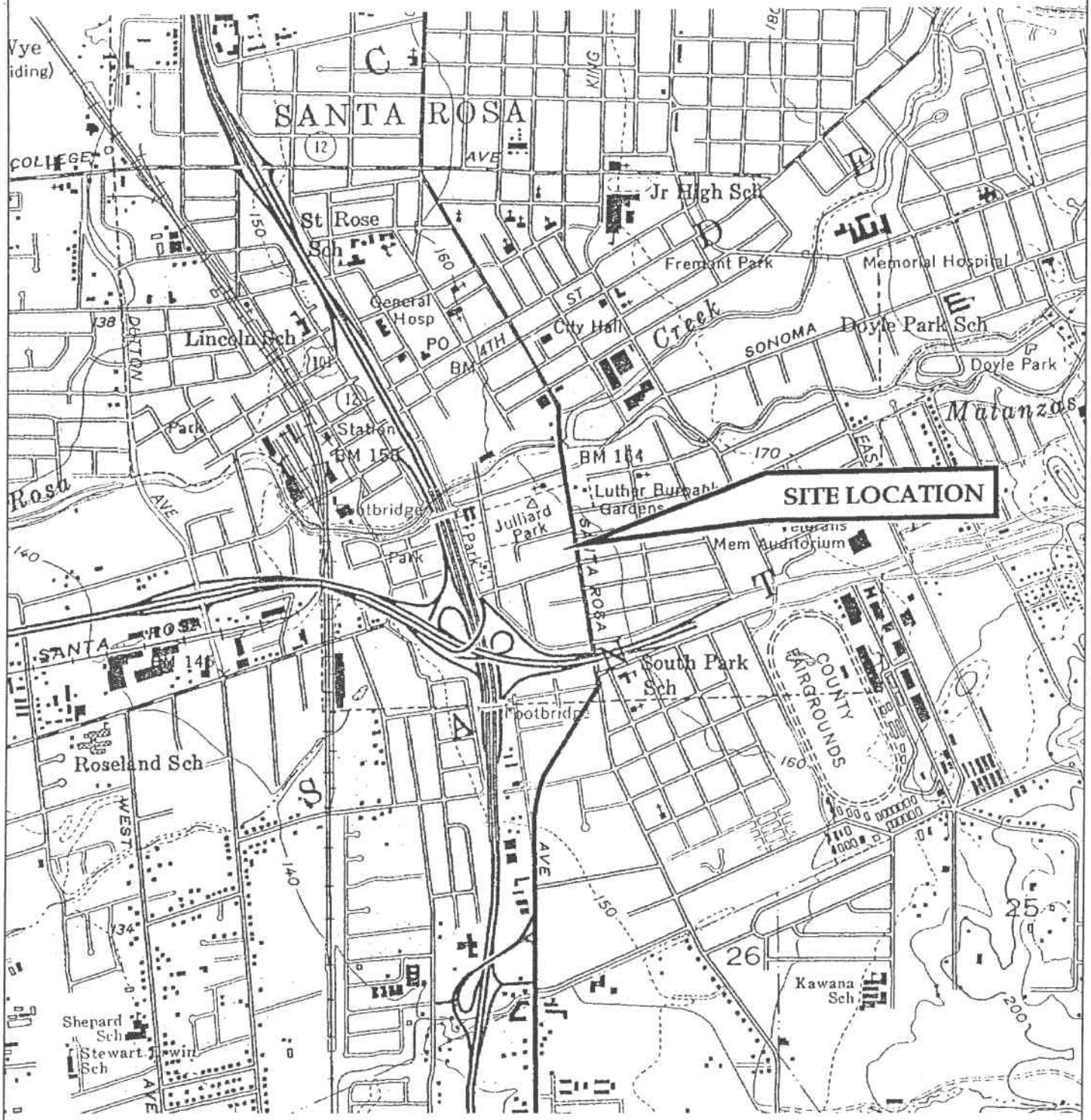
James A. Jacobs, RG# 4815, CHG#
Chief Hydrogeologist

REGISTERED GEOLOGIST
JAMES ALAN JACOBS
NO. 88
CERTIFIED HYDROGEOLOGIST
STATE OF CALIFORNIA

Cc: Mr. Franklin Wolmuth
P.O. Box 640551
San Francisco, CA 94164

Mr. Mark Pedroia
Santa Rosa Fire Department
955 Sonoma Avenue
Santa Rosa, CA 95404

FIGURES

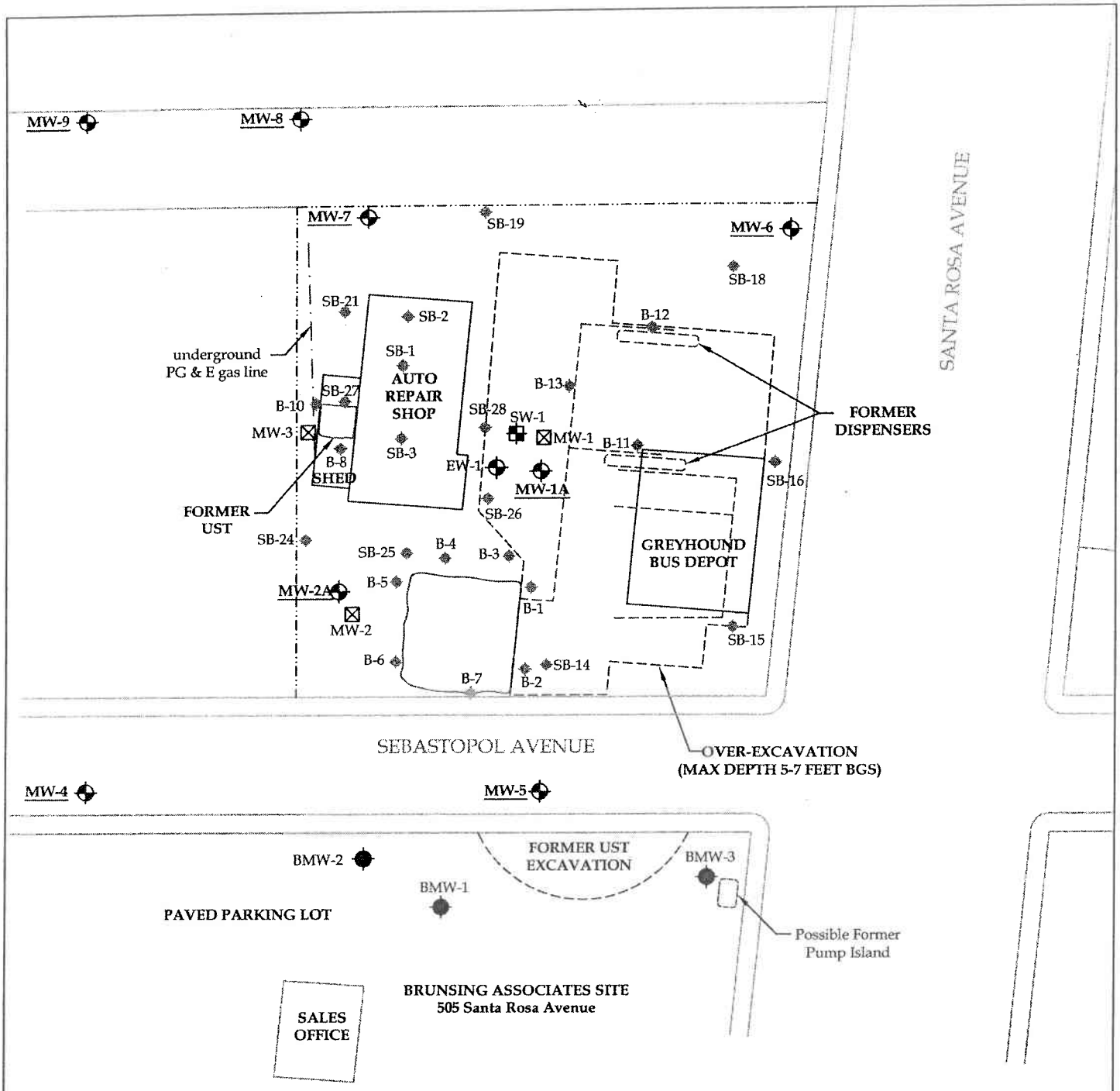


NOT TO SCALE

SITE LOCATION MAP
421 Santa Rosa Avenue
Santa Rosa, California

CLEARWATER GROUP

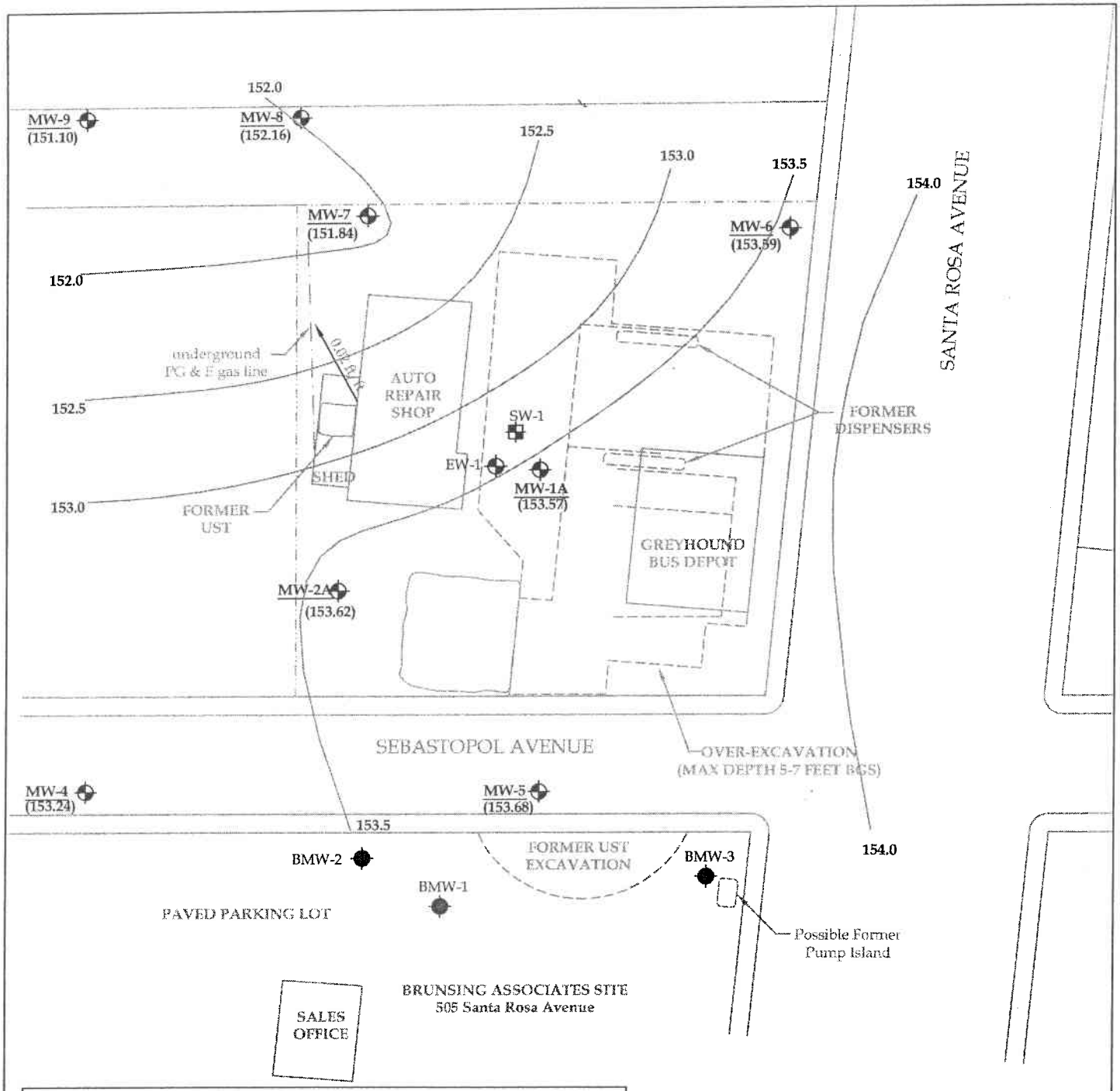
Project No.	Figure Date	Figure
AB021C	**04/05**	**1**



SITE PLAN
421 Santa Rosa Avenue
Santa Rosa, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
AB021C	**04/05**	**2**

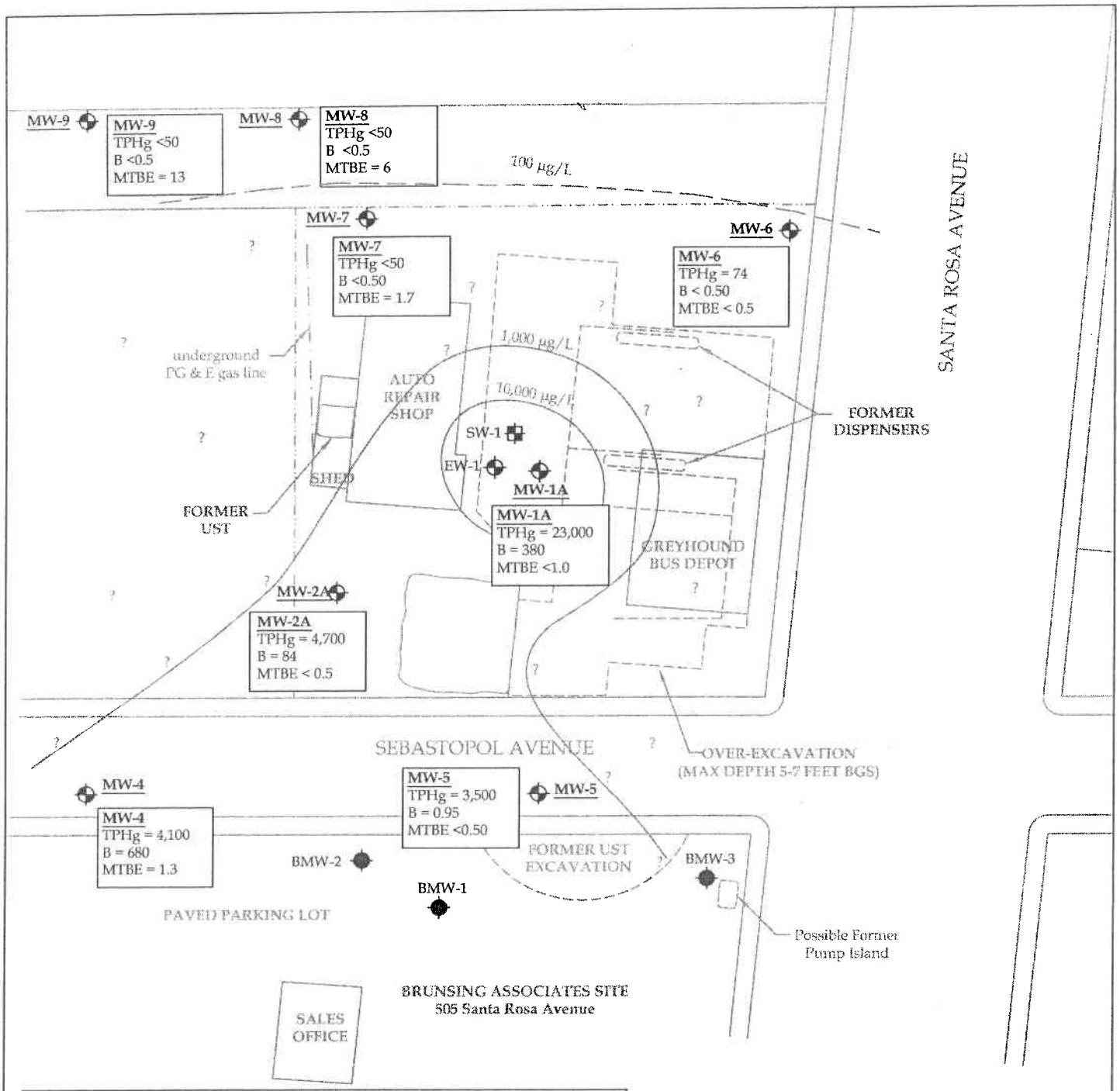


GROUNDWATER ELEVATION MAP
April 13, 2005

421 Santa Rosa Avenue
Santa Rosa, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
AB021C	**4/25/05**	**3**



LEGEND

MW-1 — MONITORING WELL

BMW-1 — BRUNSING ASSOCIATES MONITORING WELL

BEN. = 10 µg/L — BENZENE ISO-CONCENTRATION CONTOUR

MW-1
TPHg =21,000
B = 1,600
MTBE = 14

CONCENTRATIONS OF: TOTAL PARTS HYDROCARBONS AS GASOLINE (TPHg), BENZENE (B), AND METHYL TERT-BUTYL ETHER (MTBE).ALL CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L)

N

0 40 80

APPROXIMATE SCALE IN FEET

TPH-g DISTRIBUTION MAP
April 13, 2005

421 Santa Rosa Avenue
Santa Rosa, California

CLEARWATER GROUP

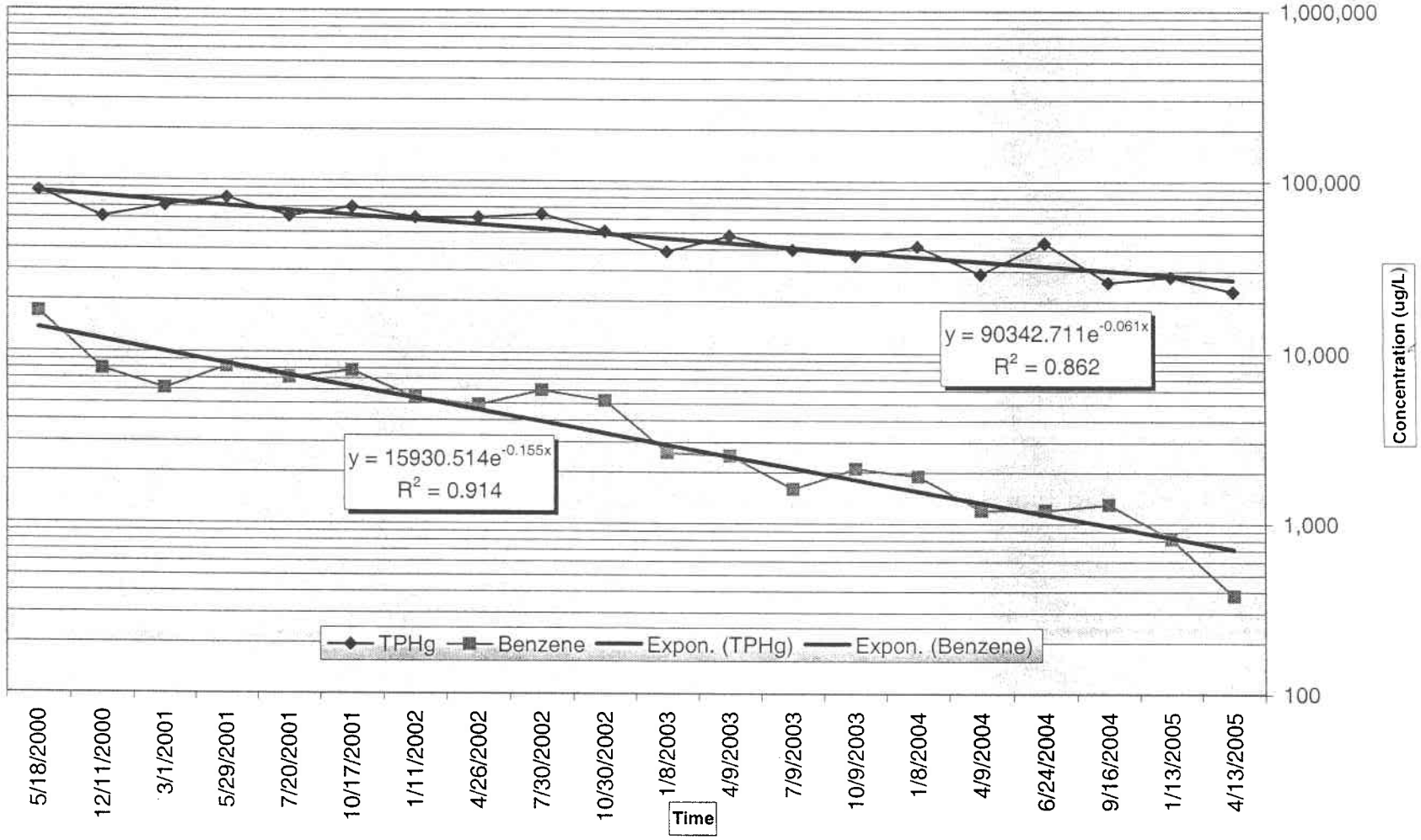
Project No.	Figure Date	Figure
AB021C	**4/24/05**	**4**

Figure 5

Empirical Evaluation of First Order Degradation Rates

MW-1A: TPHg/Benzene vs. Time

421 Santa Rosa Avenue, Santa Rosa, CA



TABLES

Table 1
WELL CONSTRUCTION DATA
421 Santa Rosa Avenue
Santa Rosa, California
Clearwater Project No. AB021C

Well I.D.	Date installed	Intstalled by	Casing diameter (inches)	Borehole diameter (inches)	Total depth (feet)	Screened Interval (feet)	Sand Interval (feet)	Slot Size (inches)	Sand Size
MW-1	12/13/1991	GPI	2	8	24	7 - 24	6 - 24	0.01	Monterey #2/12
	Destroyed 5/16/00								
MW-2	12/13/1991	GPI	2	8	25	7 - 25	6 - 25	0.01	Monterey #2/12
	Destroyed 5/16/00								
MW-3	12/16/1991	GPI	2	8	22	7 - 22	6 - 22	0.01	Monterey #2/12
	Could not be located / Unrecoverable following soil excavation remedial activities in 1996								
MW-1A	5/16/2000	Clearwater	2	8	20	5 - 20	4 - 20	0.02	Lonestar #3
MW-2A	5/16/2000	Clearwater	2	8	20	5 - 20	4 - 20	0.02	Lonestar #3
MW-4	5/17/2000	Clearwater	2	8	20	5 - 20	4 - 20	0.02	Lonestar #3
MW-5	5/17/2000	Clearwater	2	8	20	5 - 20	4 - 20	0.02	Lonestar #3
MW-6	5/16/2000	Clearwater	2	8	20	5 - 20	4 - 20	0.02	Lonestar #3
MW-7	5/16/2000	Clearwater	2	8	20	5 - 20	4 - 20	0.02	Lonestar #3
MW-8	12/5/2000	Clearwater	2	8	20	5 - 20	4 - 20	0.02	Lonestar #3
MW-9	12/5/2000	Clearwater	2	8	20	4 - 20	3.5 - 20	0.02	Lonestar #3

GPI = GeoPacific Investigations of Novato, California
Clearwater = Clearwater Group of Point Richmond, California

Table 2
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
421 Santa Rosa Avenue
Santa Rosa, California
Clearwater Group Project No. AB021C

Well-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	LNAPL (feet)	O&G (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	TPHg (µg/L)	Benzene (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	ETBE, TBA, DIPE, TAME (µg/L)	1,2 DCA (µg/L)	EDB (µg/L)
MW-1	12/26/1991	159.42	13.70	145.76	0.05	170,000	<200	82,000^	67,000	17,000	21,000	2,300	17,000	--	--	47	--
	3/28/1992	159.42	6.42	153.04	0.05	90,000	<200	3,000	120,000	35,000	27,000	1,200	2,100	--	--	110	--
	6/16/1992	159.42	10.02	149.42	0.03	<5,000	<200	12,000^	62,000	15,000	8,100	1,800	8,300	--	--	52	--
	9/19/1992	159.42	13.16	146.36	0.13	<5,000	<200	11,000^	390,000	27,000	19,000	3,600	18,000	--	--	<0.4	--
	12/13/1992	159.42	--	--	0.25	<5,000	<200	3,600^	49,000	18,000	13,000	790	10,000	--	--	39	--
	9/7/1994	159.42	--	--	0.06	<5,000	<200	61,000^	180,000	23,000	13,000	390	18,000	--	--	<0.4	--
	5/16/2000	Destroyed and replaced by MW-1A in adjacent borehole.															
MW-1A	5/18/2000	160.00	5.71	154.29	0.00	--	--	--	86,000	17,000	9,800	4,100	19,000	<250	--	--	--
	12/11/2000	160.00	10.30	149.70	0.00	--	--	--	61,000	7,900	2,900	3,400	14,000	<250†	--	--	--
	3/1/2001	159.30	5.36	153.94	0.00	--	--	--	71,000	6,100	2,100	3,200	13,000	<20	<20 to <200	<20	<20
	5/29/2001	159.30	8.69	150.61	0.00	--	--	--	79,000	8,200	3,000	3,300	13,000	<25	--	--	--
	7/20/2001	159.30	10.39	148.91	0.00	--	--	--	62,000	7,100	1,900	3,100	13,000	<25	--	<2.5	--
	10/17/2001	159.30	11.70	147.60	0.00	--	--	--	70,000	7,800	1,500	3,800	12,000	<25	--	<25	--
	1/11/2002	159.30	5.94	153.36	0.00	--	--	--	61,000	5,400	1,200	2,600	8,700	<20	--	<20	--
	4/26/2002	159.30	7.21	152.09	0.00	--	--	--	61,000	4,900	1,400	3,100	11,000	<20	--	<20	--
	7/30/2002	159.30	9.91	149.39	0.00	--	--	--	64,000	6,000	1,300	3,000	11,000	<10	--	--	--
	10/30/2002	159.30	11.16	148.14	0.00	--	--	--	51,000	5,200	420	3,400	5,200	<20	--	<2.5	--
	1/8/2003	159.30	5.32	153.98	0.00	--	--	--	39,000	2,600	600	2,100	6,600	2	--	<2.0	--
	4/9/2003	159.30	6.40	152.90	0.00	--	--	--	48,000	2,500	700	2,300	6,400	<1.5	--	<1.5	--
	7/9/2003	159.30	7.36	151.94	sheen	--	--	--	40,000	1,600	420	2,500	6,800	<1.0	--	<1.0	--
	10/9/2003	159.30	11.22	148.08	sheen	--	--	--	37,000	2,100	250	2,700	3,600	0.92	--	<0.50	--
	1/8/2004	159.30	5.00	154.30	sheen	--	--	--	42,000	1,900	410	2,200	5,600	<0.5	--	<0.5	--
	4/9/2004	159.30	6.62	152.68	0.00	--	--	--	29,000	1,200	280	1,600	4,200	<20	--	<20	--
	6/24/2004	159.30	10.05	149.25	0.00	--	--	--	44,000	1,200	210	2,200	3,600	<1.5	--	<1.5	--
	9/16/2004	159.30	12.77	146.53	0.00	--	--	--	26,000	1,300	130	1,800	2,400	0.76	TBA=12	<0.5	--
	1/13/2005	159.30	4.96	154.34	0.00	--	--	--	28,000	820	110	1,900	2,600	<1.0	--	<1.0	--
	4/13/2005	**159.30**	**5.73**	**153.57**	**0.00**	**--**	**--**	**--**	**23,000**	**380**	**70**	**1,300**	**2,200**	**<1.0**	**--**	**<1.0**	--
MW-2	12/26/1991	159.56	12.92	146.64	0.00	--	--	--	910	200	1.0	<0.50	32	--	--	--	--
	3/28/1992	159.56	5.28	154.28	0.00	--	--	--	38,000	6,500	350	1,500	1,800	--	--	--	--
	6/16/1992	159.56	9.05	150.51	0.00	--	--	--	15,000	3,000	250	1,300	1,300	--	--	--	--
	9/19/1992	159.56	12.21	147.35	0.00	--	--	--	8,700	1,100	34	340	140	--	--	--	--
	12/13/1992	159.56	--	--	0.00	--	--	--	4,500	1,400	190	490	750	--	--	--	--
	9/7/1994	159.56	--	--	0.00	<5,000	<200	1,100^	3,200	560	9.4	120	23	--	--	<0.40	--
	5/16/2000	Destroyed and replaced by MW-2A in adjacent borehole.															
MW-2A	5/18/2000	159.54	6.17	153.37	0.00	--	--	--	4,200	86	<5.0	300	260	<50†	--	--	--
	12/11/2000	159.54	11.14	148.40	0.00	--	--	--	2,700	110	11	94	91	<100†	--	--	--
	3/1/2001	158.83	5.54	153.29	0.00	--	--	--	2,800	47	0.58	96	46	<0.50	<0.50 to <5.0	<0.50	<0.50
	5/29/2001	158.83	8.91	149.92	0.00	--	--	--	6,500	100	1.3	400	100	<0.50	--	--	--
	7/20/2001	158.83	10.61	148.22	0.00	--	--	--	9,100	190	3.0	800	320	<2.5	--	--	--
	10/17/2001	158.83	12.59	146.24	0.00	--	--	--	4,000	26	0.6	84	8	<0.50	--	--	--
	1/11/2002	158.83	4.51	154.32	0.00	--	--	--	100	9.6	<0.50	<0.50	<0.50	<0.50	--	--	--
	4/26/2002	158.83	9.21	149.62	0.00	--	--	--	7,100	160	2.3	1,000	85	<0.50	--	--	--

Table 2
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
421 Santa Rosa Avenue
Santa Rosa, California
Clearwater Group Project No. AB021C

Well-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	LNAPL (feet)	O&G (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	TPHg (µg/L)	Benzene (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	ETBE, TBA, DIPE, TAME (µg/L)	1,2 DCA (µg/L)	EDB (µg/L)
MW-2A	7/30/2002	158.83	10.25	148.58	0.00	--	--	--	6,400	98	1.1	570	63	<0.50	--	--	--
	10/30/2002	158.83	12.31	146.52	0.00	--	--	--	2,700	46	<0.50	180	4.5	<0.50	--	--	--
	1/8/2003	158.83	5.04	153.79	0.00	--	--	--	5,000	240	<2.0	430	14.0	<2.0	--	--	--
	4/9/2003	158.83	6.40	152.43	0.00	--	--	--	8,400	170	<2.0	600	33	<2.0	--	--	--
	7/9/2003	158.83	8.48	150.35	0.00	--	--	--	8,400	150	<2.5	680	33	<2.5	--	--	--
	10/9/2003	158.83	11.66	147.17	sheen	--	--	--	4,500	95	0.82	250	8.1	<0.50	--	--	--
	1/8/2004	158.83	5.30	153.53	sheen	--	--	--	3,400	52	0.76	180	3.1	<0.50	--	--	--
	4/9/2004	158.83	6.63	152.20	0.00	--	--	--	3,600	49	0.64	210	4.4	<0.50	--	--	--
	6/24/2004	158.83	No Data - Vehicle Obstructed Access to Well						No Data - Vehicle Obstructed Access to Well						--	--	--
	9/16/2004	158.83	13.17	145.66	0.00	--	--	--	2,000	56	4.70	48	19.0	<0.50	ND	--	--
	1/13/2005	158.83	4.98	153.85	0.00	--	--	--	3,000	86	<0.50	190	1.7	<0.50	--	--	--
	4/13/2005	**158.83**	**5.21**	**153.62**	**0.00**	--	--	--	**4,700**	**84**	**1.0**	**210**	**2.5**	**<0.50**	--	--	--
MW-3	12/26/1991	159.37	14.32	145.05	0.00	<5,000	<200	<50	<50	3.3	<0.50	<0.50	0.70	--	--	1.9	--
	3/28/1992	159.37	6.94	152.43	0.00	<5,000	<200	<50	<50	<0.50	<0.50	<0.50	<0.50	--	--	<0.40	--
	6/16/1992	159.37	10.82	148.55	0.00	<5,000	<200	160^	320	270	1.2	9.7	13	--	--	1.1	--
	9/19/1992	159.37	13.56	145.81	0.00	<5,000	<200	<50	1,100	1.9	<0.50	<0.50	<0.50	--	--	2.6	--
	12/13/1992	159.37	--	--	0.00	<5,000	<200	150^	140	43	<0.50	4.4	12	--	--	<0.40	--
	9/7/1994	159.37	--	--	0.00	<5,000	<200	110^	<50	<0.50	<0.50	<0.50	<0.50	--	--	<0.40	--
	5/16/2000	Well could not be located following construction activities, assumed to be buried.															
MW-4	5/18/2000	157.63	4.50	153.13	0.00	--	--	--	36,000	4,600	1,100	1,800	6,900	<500†	--	--	--
	12/11/2000	157.63	9.08	148.55	0.00	--	--	--	17,000	3,500	280	600	1,600	<250†	--	--	--
	3/1/2001	156.91	3.24	153.67	0.00	--	--	--	19,000	2,400	370	640	2,100	<10	DIPE = 12	<10	<10
	5/29/2001	156.91	6.92	149.99	0.00	--	--	--	29,000	3,800	450	770	2,400	<20	--	--	--
	7/20/2001	156.91	8.79	148.12	0.00	--	--	--	13,000	3,000	88	230	300	1.9	--	--	--
	10/17/2001	156.91	10.56	146.35	0.00	--	--	--	13,000	3,300	68	280	240	<20	--	--	--
	1/11/2002	156.91	5.05	151.86	0.00	--	--	--	6,500	540	59	170	450	<2.0	--	--	--
	4/26/2002	156.91	5.03	151.88	0.00	--	--	--	14,000	1,400	200	450	1,000	0.95	--	--	--
	7/30/2002	156.91	8.26	148.65	0.00	--	--	--	16,000	2,800	180	390	1,100	1.1	--	--	--
	10/30/2002	156.91	10.17	146.74	0.00	--	--	--	12,000	2,700	45	150	87	<10	--	--	--
	1/8/2003	156.91	3.43	153.48	0.00	--	--	--	3,900	570	47	120	240	<2.5	--	--	--
	4/9/2003	156.91	4.30	152.61	0.00	--	--	--	12,000	1,100	95	290	460	<5.0	--	--	--
	7/9/2003	156.91	6.47	150.44	sheen	--	--	--	14,000	1,600	93	290	460	<10	--	--	--
	10/9/2003	156.91	9.59	147.32	0.00	--	--	--	12,000	2,300	49	180	170	<5.0	--	--	--
	1/8/2004	156.91	6.35	150.56	sheen	--	--	--	4,400	570	39	120	210	<3.0	--	--	--
	4/9/2004	156.91	5.06	151.85	0.00	--	--	--	11,000	1,700	97	270	500	<2.5	--	--	--
	6/24/2004	156.91	7.75	149.16	0.00	--	--	--	8,500	1,500	52	160	220	<5.0	--	--	--
	9/16/2004	156.91	11.04	145.87	0.00	--	--	--	8,500	1,700	28	79	68	<5.0	ND	--	--
	1/13/2005	156.91	2.99	153.92	0.00	--	--	--	2,900	330	17	60	88	1.4	--	--	--
	4/13/2005	**156.91**	**3.67**	**153.24**	**0.00**	--	--	--	**4,100**	**680**	**34**	**85**	**71**	**1.3**	--	--	--
MW-5	5/18/2000	158.13	4.01	154.12	0.00	--	--	--	18,000	90	220	700	3,100	<250†	--	--	--
	12/11/2000	158.13	7.86	150.27	0.00	--	--	--	5,200	99	46	200	650	<100†	--	--	--
	3/1/2001	157.42	3.31	154.11	0.00	--	--	--	17,000	20	110	530	2,100	<10	<3.0 to <30	<3.0	<3.0
	5/29/2001	157.42	6.81	150.61	0.00	--	--	--	5,900	70	23	100	330	<0.50	--	--	--
	7/20/2001	157.42	8.67	148.75	0.00	--	--	--	5,500	93	13	90	310	<1.0	--	--	--
	10/17/2001	157.42	10.39	147.03	0.00	--	--	--	5,200	130	4.6	40	69	1.6	--	--	--
	1/11/2002	157.42	4.13	153.29	0.00	--	--	--	8,300	4.8	27	170	580	<2.0	--	--	--
	4/26/2002	157.42	4.93	152.49	0.00	--	--	--	6,500	16	29	160	530	<2.0	--	--	--
	7/30/2002	157.42	8.13	149.29	0.00	--	--	--	4,300	38	10	120	250	<1.0	--	--	--

Table 2
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
421 Santa Rosa Avenue
Santa Rosa, California
Clearwater Group Project No. AB021C

Well-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	LNAPL (feet)	O&G (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	TPHg (µg/L)	Benzene (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	ETBE, TBA, DIPE, TAME (µg/L)	1,2 DCA (µg/L)	EDB (µg/L)
MW-5	10/30/2002	157.42	10.04	147.38	0.00	--	--	--	3,800	130	8.4	60	80	0.81	--	--	--
	1/8/2003	157.42	3.36	154.06	0.00	--	--	--	6,000	9.8	24.0	130	410	<1.0	--	--	--
	4/9/2003	157.42	4.35	153.07	0.00	--	--	--	12,000	<5.0	24	310	1,000	<5.0	--	--	--
	7/9/2003	157.42	6.43	150.99	0.00	--	--	--	3,200	31	5.9	35	50	<0.50	--	--	--
	10/9/2003	157.42	9.60	147.82	0.00	--	--	--	3,100	40	4.6	22	36	0.90	--	--	--
	1/8/2004	157.42	6.20	151.22	0.00	--	--	--	4,600	4	12.0	100	270	0.51	--	--	--
	4/9/2004	157.42	4.98	152.44	0.00	--	--	--	3,700	8.2	5.3	22	34	0.53	--	--	--
	6/24/2004	157.42	7.85	149.57	0.00	--	--	--	3,900	14.0	4.2	44	85	0.86	--	--	--
	9/16/2004	157.42	11.01	146.41	0.00	--	--	--	2,300	19.0	2.4	8	12	0.97	ND	--	--
	1/13/2005	157.42	3.16	154.26	0.00	--	--	--	2,400	0.5	2.8	32	68	<0.50	--	--	--
	4/13/2005	**157.42**	**3.74**	**153.68**	**0.00**	--	--	--	**3,500**	**0.95**	**2.0**	**51**	**100**	**<0.50**	--	--	--
MW-6	5/18/2000	159.65	6.00	153.65	0.00	--	--	--	330	4.2	<0.50	12	3.2	<5.0†	--	--	--
	12/11/2000	159.65	10.14	149.51	0.00	--	--	--	130*	0.96	<0.50	<0.50	<0.50	<5.0†	--	--	--
	3/1/2001	158.95	5.77	153.18	0.00	--	--	--	200	<0.50	<0.50	5.3	<0.50	<0.50	<0.50 to <5.0	<0.50	<0.50
	5/29/2001	158.95	8.46	150.49	0.00	--	--	--	120	<0.50	<0.50	1.1	<0.50	<0.50	--	--	--
	7/20/2001	158.95	10.27	148.68	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
	10/17/2001	158.95	11.78	147.17	0.00	--	--	--	<50	<0.50	<0.50	0.72	<0.50	<0.50	--	--	--
	1/11/2002	158.95	5.48	153.47	0.00	--	--	--	410	<0.50	<0.50	6.5	<0.50	<0.50	--	--	--
	4/26/2002	158.95	9.74	149.21	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
	7/30/2002	158.95	9.60	149.35	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
	10/30/2002	158.95	11.55	147.40	0.00	--	--	--	260	<0.50	<0.50	5.8	<0.50	<0.50	--	--	--
	1/8/2003	158.95	4.97	153.98	0.00	--	--	--	87	<0.50	<0.50	1.1	<0.50	<0.50	--	--	--
	4/9/2003	158.95	6.05	152.90	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
	7/9/2003	158.95	8.02	150.93	0.00	--	--	--	360	17	<0.50	5.4	<0.50	0.55	--	--	--
	10/9/2003	158.95	10.89	148.06	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
	1/8/2004	158.95	4.50	154.45	0.00	--	--	--	140	<0.50	<0.50	0.82	<0.50	<0.50	--	--	--
	4/9/2004	158.95	6.42	152.53	0.00	--	--	--	53	<0.50	<0.50	1.00	<0.50	<0.50	--	--	--
	6/24/2004	158.95	9.33	149.62	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
	9/16/2004	158.95	12.28	146.67	0.00	--	--	--	<50	<0.50	0.67	0.68	1.30	<0.50	ND	--	--
	1/13/2005	158.95	4.32	154.63	0.00	--	--	--	180	<0.50	<0.50	2.90	<0.50	<0.50	--	--	--
	4/13/2005	**158.95**	**5.36**	**153.59**	**0.00**	--	--	--	**74**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	--	--	--
MW-7	5/18/2000	160.28	8.82	151.46	0.00	--	--	--	430	150	1.5	17	21	<5.0†	--	--	--
	12/11/2000	160.28	13.32	146.96	0.00	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0†	--	--	--
	3/1/2001	159.58	7.57	152.01	0.00	--	--	--	840	430	<1.0	<1.0	<1.0	6.8	TBA = 20	<1.0	<1.0
	5/29/2001	159.58	11.11	148.47	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.7	--	--	--
	7/20/2001	159.58	12.72	146.86	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.6	--	--	--
	10/17/2001	159.58	14.38	145.20	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.9	--	--	--
	1/11/2002	159.58	7.50	152.08	0.00	--	--	--	140	57	<0.50	<0.50	<0.50	5.9	--	--	--
	4/26/2002	159.58	9.67	149.91	0.00	--	--	--	140	16	<0.50	3.2	<0.50	2.3	--	--	--
	7/30/2002	159.58	12.24	147.34	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.7	--	--	--
	10/30/2002	159.58	14.17	145.41	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.6	--	--	--
	1/8/2003	159.58	7.26	152.32	0.00	--	--	--	61	18	<0.50	<0.50	<0.50	4.3	--	--	--
	4/9/2003	159.58	8.85	150.73	0.00	--	--	--	510	110	<0.50	3.8	5.5	4.3	--	--	--
	7/9/2003	159.58	10.77	148.81	0.00	--	--	--	170	<0.50	<0.50	<0.50	<0.50	3.3	--	--	--
	10/9/2003	159.58	13.50	146.08	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	2.0	--	--	--
	1/8/2004	159.58	7.36	152.22	0.00	--	--	--	190	62	<0.50	<0.50	<0.50	7.0	--	--	--
	4/9/2004	159.58	Not Monitored due to vehicle obstructing well access.														
	6/24/2004	159.58	11.91	147.67	0.00	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	2.30	--	--	--
	9/16/2004	159.58	14.97	144.61	0.00	--	--	--	53	<0.50	0.59	0.66	2.20	2.80	ND	--	--

Table 2
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
421 Santa Rosa Avenue
Santa Rosa, California
Clearwater Group Project No. AB021C

Well-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	LNAPL (feet)	O&G (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	TPHg (µg/L)	Benzene (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	ETBE, TBA, DIPE, TAME (µg/L)	1,2 DCA (µg/L)	EDB (µg/L)
MW-7	1/13/2005	159.58	6.68	152.90	0.00	--	--	--	490	180	16.00	2.10	11.00	3.90	--	--	--
	4/13/2005	**159.58**	**7.74**	**151.84**	**0.00**	--	--	--	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**1.7**	--	--	--
MW-8	12/11/2000	159.98	13.11	146.87	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<5.0†	--	--	--
	3/1/2001	159.29	7.06	152.23	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	2.1	<0.50 to <5.0	<0.50	<0.50
	5/29/2001	159.29	10.88	148.41	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.6	--	--	--
	7/20/2001	159.29	12.43	146.86	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.7	--		--
	10/17/2001	159.29	13.47	145.82	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	2.1	--	--	--
	1/11/2002	159.29	7.04	152.25	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.9	--	--	--
	4/26/2002	159.29	8.59	150.70	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	2.9	--	--	--
	7/30/2002	159.29	11.95	147.34	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	3.2	--	--	--
	10/30/2002	159.29	13.91	145.38	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	2.7	--	--	--
	1/8/2003	159.29	7.14	152.15	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	3.5	--	--	--
	4/9/2003	159.29	8.67	150.62	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	5.1	--	--	--
	7/9/2003	159.29	10.54	148.75	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	4.1	--	--	--
	10/9/2003	159.29	13.25	146.04	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	3.1	--	--	--
	1/8/2004	159.29	7.80	151.49	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	6.0	--	--	--
	4/9/2004	159.29	9.03	150.26	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	5.7	--	--	--
	6/24/2004	159.29	11.72	147.57	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	4.6	--	--	--
	9/16/2004	159.29	14.69	144.60	0.00	--	--	--	52	2.0	2.4	2.0	6.5	5.1	--	--	--
	1/13/2005	159.29	6.59	152.70	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	2.2	--	--	--
	4/13/2005	**159.29**	**7.13**	**152.16**	**0.00**	--	--	--	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**6**	--	--	--
MW-9	12/11/2000	159.39	12.61	146.78	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<5.0†	--	--	--
	3/1/2001	158.69	6.94	151.75	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	2.0	TBA = 5.1	<0.50	<0.50
	5/29/2001	158.69	10.40	148.29	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	3.5	--	--	--
	7/20/2001	158.69	11.98	146.71	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	1.6	--	--	--
	10/17/2001	158.69	13.61	145.08	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	4.9	--	--	--
	1/11/2002	158.69	7.02	151.67	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	41	--	--	--
	4/26/2002	158.69	9.04	149.65	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	18	--	--	--
	7/30/2002	158.69	11.48	147.21	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	9.9	--	--	--
	10/30/2002	158.69	13.38	145.31	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	12	--	--	--
	1/8/2003	158.69	6.94	151.75	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	44	--	--	--
	4/9/2003	158.69	8.25	150.44	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	15	--	--	--
	7/9/2003	158.69	10.09	148.60	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	18	--	--	--
	10/9/2003	158.69	12.74	145.95	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	12	--	--	--
	1/8/2004	158.69	6.70	151.99	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	26	--	--	--
	4/9/2004	158.69	8.55	150.14	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	7	--	--	--
	6/24/2004	158.69	11.18	147.51	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	12	--	--	--
	9/16/2004	158.69	14.17	144.52	0.00	--	--	--	150	4.3	6.9	6.9	23	8.6	ND	--	--
	1/13/2005	158.69	6.16	152.53	0.00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	20.0	--	--	--
	4/13/2005	**158.69**	**7.59**	**151.10**	**0.00**	--	--	--	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**13**	--	--	--
SB-14-H20	9/9/1994	--	--	--	--	--	--	--	1,800	580	71	120	350	--	--	--	--
SB-15-H20	9/9/1994	--	--	--	--	--	--	--	950	240	160	48	220	--	--	--	--
SB-16-H20	9/9/1994	--	--	--	--	--	--	--	1,400	250	34	120	420	--	--	--	--
SB-18-H20	9/9/1994	--	--	--	--	--	--	--	18	<0.50	<0.50	<0.50	2.4	--	--	--	--
SB-19-H20	9/8/1994	--	--	--	--	<5,000	<1,000	<1,000	36	<0.50	2.7	1.8	7.7	--	--	<0.50	--
SB-24-H20	9/8/1994	--	--	--	--	<5,000	<1,000	<1,000	22	<0.50	0.5	<0.50	1.8	--	--	2.0	--
SB-26-H20	9/8/1994	--	--	--	--	<5,000	<1,000	9,800^	12,000	2,000	1,600	380	2,100	--	--	0.7	--

Table 2
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
421 Santa Rosa Avenue
Santa Rosa, California
Clearwater Group Project No. AB021C

Well-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	LNAPL (feet)	O&G (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	TPHg (µg/L)	Benzene (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	ETBE, TBA, DIPE, TAME (µg/L)	1,2 DCA (µg/L)	EDB (µg/L)

Notes:

Well No.	Well designation
Date	Sample collection date
TOC	Elevation at the top of the well casing referenced to City of Santa Rosa bench mark C-41, relative to MSL as of 3/1/01
DTW	Depth to water
GWE	Ground water elevation
LNAPL	Light Non-Aqueous Phase Liquid hyrocarbons present, sheen = <0.01-foot thick
O&G	Oil Grease using DHOS Method 553
TPHmo	Total Petroleum Hydrocarbons as Motor Oil byEPA Method 8015M
TPHd	Total Petroleum Hydrocarbons as Diesel byEPA Method 8015M
TPHg	Total Petroleum Hydrocarbons as Gasoline byEPA Method 8015M or 8260B
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes by EPA Method 8020 or 8260B

Notes:

MTBE	Methyl tert-Butyl Ether by EPA Method 8260B
ETBE, TBA, DIPE, TAME	Fuel Oxygenates by EPA Method 8260B
1,2 DCA	1,2-Dichloroethane by EPA Method 8260B
EDB	1,2-Dibromoethane by EPA Method 8260B
µg/L	micrograms per liter (approximately equal to parts per billion)
--	Not tested, not measured
<###	Not detected in concentrations exceeding the indicated laboratory reporting limit
^	Labortory reports lighter than diesel range hydrocarbons present in sample (from GPI reports)
*	Labortory report indicates chromatogram atypical of gasoline
†	MTBE by EPA Method 8020

Table 3
CURRENT GROUNDWATER ELEVATIONS AND SAMPLE ANALYTICAL RESULTS
421 Santa Rosa Avenue
Santa Rosa, California

Well I. D.	Sampling Date	TOC (feet)	DTW (feet)	GWE (feet)	DO mg/L	ORP mV	Total Fe mg/L	Fe^{2+} mg/L	Fe^{2+}/Total Fe Ratio
MW-1A	9/16/2004	159.30	12.77	146.53	1.0	63	2.8	2.0	0.71
	1/13/2005	159.30	4.96	154.34	0.1	43	3.4	2.8	0.82
	4/13/2005	**159.30**	**5.73**	**153.57**	**0.1**	**39**	**2.4**	**0.6**	**0.25**
MW-2A	9/16/2004	158.83	13.17	145.66	0.6	35	5.6	3.4	0.61
	1/13/2005	158.83	4.98	153.85	0.1	33	3.8	2.6	0.68
	4/13/2005	**158.83**	**5.21**	**153.62**	**0.1**	**34**	**3.6**	**2.0**	**0.56**
MW-4	9/16/2004	156.91	11.04	145.87	0.3	39	5.0	3.8	0.76
	1/13/2005	156.91	2.99	153.92	0.1	43	3.4	2.8	0.82
	4/13/2005	**156.91**	**3.67**	**153.24**	**0.1**	**42**	**3.4**	**1.2**	**0.35**
MW-5	9/16/2004	157.42	11.01	146.41	0.1	35	3.0	2.8	0.93
	1/13/2005	157.42	3.16	154.26	0.1	27	3.8	2.4	0.63
	4/13/2005	**157.42**	**3.74**	**153.68**	**0.0**	**35**	**2.2**	**1.2**	**0.55**
MW-6	9/16/2004	158.95	12.28	146.67	0.2	15	0.0	0.0	
	1/13/2005	158.95	4.32	154.63	0.0	36	1.2	0.0	0.00
	4/13/2005	**158.95**	**5.36**	**153.59**	**0.0**	**34**	**0.3**	**0.0**	**0.00**
MW-7	9/16/2004	159.58	14.97	144.61	0.3	48	1.0	0.0	0.00
	1/13/2005	159.58	6.68	152.90	0.5	44	0.0	0.0	
	4/13/2005	**159.58**	**7.74**	**151.84**	**0.2**	**38**	**0.0**	**0.0**	
MW-8	9/16/2004	159.29	14.69	144.60	6.6	36	0.0	0.0	
	1/13/2005	159.29	6.59	152.70	0.6	35	0.1	0.0	0.00
	4/13/2005	**159.29**	**7.13**	**152.16**	**0.1**	**39**	**0.0**	**0.0**	
MW-9	9/16/2004	158.69	14.17	144.52	0.8	33	1.5	0.0	0.00
	1/13/2005	158.69	6.16	152.53	0.0	34	0.2	0.0	0.00
	4/13/2005	**158.69**	**7.59**	**151.10**	**0.2**	**34**	**0.2**	**0.0**	**0.00**

Table 3

CURRENT GROUNDWATER ELEVATIONS AND SAMPLE ANALYTICAL RESULTS

421 Santa Rosa Avenue

Santa Rosa, California

Well I. D.	Sampling Date	TOC (feet)	DTW (feet)	GWE (feet)	DO mg/L	ORP mV	Total Fe mg/L	Fe^{2+} mg/L	Fe^{2+}/Total Fe Ratio

Notes:

TOC	Top of casing elevation referenced to project datum
DTW	Depth to water below TOC
GWE	Groundwater elevation (TOC-DTW)
DO	dissolved oxygen - milligrams per liter (mg/L)
ORP	oxidation-reduction potential - millivolts (mV)
Total Fe	total iron - milligrams per liter (mg/L)
Fe^{2+}	ferrous iron - milligrams per liter (mg/L)

APPENDIX A

Clearwater's Field Protocols

CLEARWATER GROUP

Groundwater Monitoring and Sampling Field Procedures

Groundwater Monitoring

Prior to beginning, a decontamination area is established. Decontamination procedures consist of scrubbing downhole equipment in an Alconox® solution wash (wash solution is pumped through any purging pumps used), and rinsing in a first rinse of potable water and a second rinse of potable water or deionized water if the latter is required. Any non-dedicated downhole equipment is decontaminated prior to use.

Prior to purging and sampling a well, the static water level is measured to the nearest 0.01 feet with an electronic water sounder. Depth to bottom is typically measured once per year, at the request of the project manager, and during Clearwater's first visit to a site. If historical analytical data are not available, with which to establish a reliable order of increasing well contamination, the water sounder and tape will be decontaminated between each well. If floating separate-phase hydrocarbons (SPH) are suspected or observed, SPH is collected using a clear, open-ended product bailer, and the thickness is measured to the nearest 0.01 feet in the bailer. SPH may alternatively be measured with an electronic interface probe. Any monitoring well containing a measurable thickness of SPH before or during purging is not additionally purged and no sample is collected from that well. Wells containing hydrocarbon sheen are sampled unless otherwise specified by the project manager. Field observations such as well integrity as well as water level measurements and floating product thicknesses are noted on the Gauging Data/Purge Calculations form.

Well Purging

Each monitoring well to be sampled is purged using either a PVC bailer or a submersible pump. Physical parameters (pH, temperature and conductivity) of the purge water are monitored during purging activities to assess if the water sample collected is representative of the aquifer. If required, parameters such as dissolved oxygen, turbidity, salinity etc. are also measured. Samples are considered representative if parameter stability is achieved. Stability is defined as a change of less than 0.25 pH units, less than 10% change in conductivity in micro mhos, and less than 1.0 degree centigrade (1.8 degrees Fahrenheit) change in temperature. Parameters are measured in a discreet sample decanted from the bailer separately from the rest of the purge water. Parameters are measured at least four times during purging; initially, and at volume intervals of one well volume. Purging continues until three well casing volumes have been removed or until the well completely dewaters. Wells which dewater or demonstrate a slow recharge may be sampled after fewer than three well volumes have been removed. Well purging information is recorded on the Purge Data sheet. All meters used to measure parameters are calibrated daily. Purge water is sealed, labeled, and stored on site in D.O.T.-approved 55-gallon drums. After being chemically profiled, the water is removed to an appropriate disposal facility by a licensed waste hauler.

Groundwater Sample Collection

Groundwater samples are collected immediately after purging or, if purging rate exceeds well recharge rate, when the well has recharged to at least 80% of its static water level. If recharge is extremely slow, the well is allowed to recharge for at least two hours, if practicable, or until sufficient volume has accumulated for sampling. The well is sampled within 24 hours of purging or repurged. Samples are collected using polyethylene bailers, either disposable or dedicated to the well. Samples being analyzed for compounds most sensitive to volatilization are collected first. Water samples are placed in appropriate laboratory-supplied containers, labeled, documented on a chain of custody form and placed on ice in a cooler for transport to a state-certified analytical laboratory. Analytical detection limits match or surpass standards required by relevant local or regional guidelines.

Quality Assurance Procedures

To prevent contamination of the samples, Clearwater personnel adhere to the following procedures in the field:

- A new, clean pair of latex gloves is put on prior to sampling each well.
- Wells are gauged, purged and groundwater samples are collected in the expected order of increasing degree of contamination based on historical analytical results.

- All purging equipment will be thoroughly decontaminated between each well, using the procedures previously described at the beginning of this section.

- During sample collection for volatile organic analysis, the amount of air passing through the sample is minimized. This helps prevent the air from stripping the volatiles from the water. Sample bottles are filled by slowly running the sample down the side of the bottle until there is a convex meniscus over the mouth of the bottle. The lid is carefully screwed onto the bottle such that no air bubbles are present within the bottle. If a bubble is present, the cap is removed and additional water is added to the sample container. After resealing the sample container, if bubbles still are present inside, the sample container is discarded and the procedure is repeated with a new container.

Laboratory and field handling procedures may be monitored, if required by the client or regulators, by including quality control (QC) samples for analysis with the groundwater samples. Examples of different types of QC samples are as follows:

- Trip blanks are prepared at the analytical laboratory by laboratory personnel to check field handling procedures. Trip blanks are transported to the project site in the same manner as the laboratory-supplied sample containers to be filled. They are not opened, and are returned to the laboratory with the samples collected. Trip blanks are analyzed for purgeable organic compounds.

- Equipment blanks are prepared in the field to determine if decontamination of field sampling equipment has been effective. The sampling equipment used to collect the groundwater samples is rinsed with distilled water which is then decanted into laboratory-supplied containers. The equipment blanks are transported to the laboratory, and are analyzed for the same chemical constituents as the samples collected at the site.

- Duplicates are collected at the same time that the standard groundwater samples are being collected and are analyzed for the same compounds in order to check the reproducibility of laboratory data. They are typically only collected from one well per sampling event. The duplicate is assigned an identification number that will not associate it with the source well.

Generally, trip blanks and field blanks check field handling and transportation procedures. Duplicates check laboratory procedures. The configuration of QC samples is determined by Clearwater depending on site conditions and regulatory requirements.

APPENDIX B

Field Gauging and Purging logs

CLEARWATER GROUP

229 Tewksbury Ave, Point Richmond, CA 94801
Phone: (510)307-9943 Fax: (510) 232-2823

WELL GAUGING/PURGING CALCULATIONS DATA SHEET

Date: 4/13/05 | Job No.: ABM216 | Location: 421 SANTA ROSA AVE SANTA ROSA, CA

Tech(s): RODNEY BERRY

Drums on Site @TOA — Soil: 0 Water: 0

Drums on Site @ TOD — Soil: 0 Water: 0

Well No	Diameter (in)	DTB (ft)	DTW (ft)	ST (ft)	CV (gal)	PV (gal)	SPL (ft)	Notes
MW-8	2	19.24	7.13	12.11	1.93	5.81		
9		18.15	7.59	10.56	1.68	5.06		
6		19.55	5.36	14.19	2.27	6.81		
7		19.17	7.74	11.43	1.82	5.48		CARRYOVER 1'
5		19.03	3.74	15.29	2.43	7.30		3.73 BELOW
4		18.95	3.67	15.28	2.44	7.33		3.59 ASS 93
2A		19.74	5.21	14.53	2.32	6.97		
1A		19.65	5.73	13.92	2.22	6.68		

Explanation:
DTB = Depth to Bottom
DTW = Depth to Water
ST = Saturated Thickness (DTB-DTW)
CV = Casing Volume (ST x cf)
PV = Purge Volume (standard 3 x CV, well development 10 x CV)
SPL = Thickness of Separate Phase Liquid

Conversion Factors (cf)
2-inch diameter well cf=0.16 gal/ft
4-inch diameter well cf=0.65 gal/ft
6-inch diameter well cf=1.44 gal/ft

1/21 SANTA ROSA #1C

PURGING DATA

SHEET 1 OF 3

Job No.: 4B0210 Location: SANTA ROSA, CA Date: 1/13/05 Tech: RODNEY BRE

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH
MW-8	1242	2.00	804	66.5	6.61
Calc. purge	1246	4.00	802	66.5	6.60
volume	1251	6.00	800	66.5	6.60
5.81					

1300 DO = 00.1 FE = 0.
ORP = 039 FE2+ = 0

Sample for: TPHg TPHd 8010 BTEX Other MTBE 8260

Purging Method: PVC bailer / Pump

Sampling Method: Dedicated / Disposable bailer

COMMENTS: color, turbidity, recharge, sheen

CLEAR, low, good, No sheen

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH
MW-9	1317	2.00	530	64.5	6.61
Calc. purge	1323	4.00	532	64.5	6.61
volume	1326	5.50	522	64.5	6.60
5.06					

1330 DO = 00.2 FE = 0.
ORP = 034 FE2+ = 0

Sample for: TPHg TPHd 8010 BTEX Other MTBE 8260

Purging Method: PVC bailer / Pump

Sampling Method: Dedicated / Disposable bailer

COMMENTS: color, turbidity, recharge, sheen

CLEAR, low, good, no sheen

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH
MW-6	1342	2.00	585	66.2	6.57
Calc. purge	1347	4.00	583	66.3	6.56
volume	1353	7.00	586	66.2	6.56
6.81					

1400 DO = 00.0 FE = 0.3
ORP = 034 FE2+ = 0

Sample for: TPHg TPHd 8010 BTEX Other MTBE 8260

Purging Method: PVC bailer / Pump

Sampling Method: Dedicated / Disposable bailer

COMMENTS: color, turbidity, recharge, sheen

CLEAR, low, good, no sheen

CLEARWATER GROUP, 229 Tewksbury Ave., Point Richmond, California 94801
Phone: 510-307-9943 Fax: 510-232-2823

PURGE DATA SHEET

Job No.: 4802C Location: 421 SANTA ROSA AVE SANTA ROSA, CA Date: 4/13/05 Sheet 2 of 3 Tech: RODNEY B

1430

WELL #	TIME	VOL. (gal.)	ORP	CND	TMP	DO	pH	Fe^{2+}	Fe_T	
MW-7	1417	2.00	038	772	63.8	60.2	6.44	0.0	0.0	Sample for:
Calc. purge	1422	4.00		772	63.9		6.44			TPHg TPHd 8260
volume	1427	5.50		772	63.9		6.45			BTEX MTBE Metals
5.48										Purging Method:
										PVC Bailer/Pump/Disp. Bailer

COMMENTS: color, turbidity, recharge, sheen, odor

CLEAR, LOW, GOOD, NO SHEEN

POST DEPTH TO WATER: _____ SAMPLE TIME: 1430

WELL #	TIME	VOL. (gal.)	ORP	CND	TMP	DO	pH	Fe^{2+}	Fe_T	
MW-5	1438	2.00	035	487	68.6	00.0	6.51	2.2	1.2	Sample for:
Calc. purge	1443	5.00		487	68.6		6.51			TPHg TPHd 8260
volume	1447	7.50		487	68.7		6.51			BTEX MTBE Metals
7.30										Purging Method:
										PVC Bailer/Pump/Disp. Bailer

COMMENTS: color, turbidity, recharge, sheen, odor

CLEAR, LOW, GOOD, NO SHEEN, SLIGHT ODOR

POST DEPTH TO WATER: _____ SAMPLE TIME: 1500

WELL #	TIME	VOL. (gal.)	ORP	CND	TMP	DO	pH	Fe^{2+}	Fe_T	
MW-4	1513	2.00	042	729	66.2	00.1	6.37	1.2	3.4	Sample for:
Calc. purge	1518	5.00		729	66.2		6.36			TPHg TPHd 8260
volume	1524	7.50		729	66.3		6.37			BTEX MTBE Metals
7.83										Purging Method:
										PVC Bailer/Pump/Disp. Bailer

COMMENTS: color, turbidity, recharge, sheen, odor

CLEAR, LOW, GOOD, NO SHEEN, SLIGHT ODOR

POST DEPTH TO WATER: _____ SAMPLE TIME: 1530

PURGING DATA

SHEET 3 OF 3

Job No.: 421 SANTA ROSA AVE Location: SANTA ROSA, CA Date: 1/13/05 Tech: RODNEY BERRU

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH
MW-2A	1537	3.00	715	63.3	6.56
	1544	5.00	716	63.2	6.56
	1548	7.00	714	63.4	6.58

Calc. purge volume: 6.97

1606 DO = 80.1 FE = 3.6 ORP = 034 FE2+ =

Sample for: TPHg TPHd 8010 BTEX Other MTBE 8260

Purging Method: PVC bailer / Pump

Sampling Method: Dedicated / Disposable bailer

COMMENTS: color, turbidity, recharge, sheen

CLEAR, low, good, No sheen, odor

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH
MW-1A	1612	3.00	539	65.3	6.36
	1614	6.00	537	65.2	6.35
	1619	7.00	539	65.1	6.36

Calc. purge volume: 6.68

1630 DO = 091 FE = 2.6 ORP = 039 FE2+ =

Sample for: TPHg TPHd 8010 BTEX Other MTBE 8260

Purging Method: PVC bailer / Pump

Sampling Method: Dedicated / Disposable bailer

COMMENTS: color, turbidity, recharge, sheen

CLEAR, low, good, No sheen, STRONG odor

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH

Calc. purge volume: _____

Sample for: TPHg TPHd 8010 BTEX Other MTBE 8260

Purging Method: PVC bailer / Pump

Sampling Method: Dedicated / Disposable bailer

COMMENTS: color, turbidity, recharge, sheen

CLEARWATER GROUP, 229 Tewksbury Ave., Point Richmond, California 94801
Phone: 510-307-9943 Fax: 510-232-2823

APPENDIX C

Laboratory Analytical Reports and Chain-of-Custody Record

KIFF ANALYTICAL LLC

Report Number : 43288
Date : 4/20/2005

Jim Ho
Clearwater Group, Inc.
229 Tewksbury Avenue
Point Richmond, CA 94801

Subject : 8 Water Samples
Project Name : 421 SANTA ROSA
Project Number : AB021C

Dear Mr. Ho,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 43288
Date : 4/20/2005

Project Name : **421 SANTA ROSA**
Project Number : **AB021C**

Sample : **MW-1A** Matrix : Water Lab Number : 43288-08
Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**380**	4.0	ug/L	EPA 8260B	4/16/2005
Toluene	**70**	4.0	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	**1300**	4.0	ug/L	EPA 8260B	4/16/2005
Total Xylenes	**2200**	4.0	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	**< 1.0**	1.0	ug/L	EPA 8260B	4/19/2005
TPH as Gasoline	**23000**	400	ug/L	EPA 8260B	4/16/2005
1,2-Dichloroethane	**< 1.0**	1.0	ug/L	EPA 8260B	4/19/2005
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	98.4		% Recovery	EPA 8260B	4/16/2005
Dibromofluoromethane (Surr)	102		% Recovery	EPA 8260B	4/16/2005
1,2-Dichloroethane-d4 (Surr)	99.0		% Recovery	EPA 8260B	4/16/2005

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 43288
Date : 4/20/2005

Project Name : **421 SANTA ROSA**
Project Number : **AB021C**

Sample : **MW-2A** Matrix : Water Lab Number : 43288-07
Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**84**	0.50	ug/L	EPA 8260B	4/16/2005
Toluene	**1.0**	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	**210**	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	**2.5**	0.50	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	**4700**	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	4/16/2005

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 43288
Date : 4/20/2005

Project Name : **421 SANTA ROSA**
Project Number : **AB021C**

Sample : **MW-4** Matrix : Water Lab Number : 43288-06

Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**680**	1.5	ug/L	EPA 8260B	4/16/2005
Toluene	**34**	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	**85**	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	**71**	0.50	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	**1.3**	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	**4100**	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	99.1		% Recovery	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	99.9		% Recovery	EPA 8260B	4/16/2005

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 43288
Date : 4/20/2005

Project Name : **421 SANTA ROSA**
Project Number : **AB021C**

Sample : **MW-5** Matrix : Water Lab Number : 43288-05
Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.95**	0.50	ug/L	EPA 8260B	4/16/2005
Toluene	**2.0**	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	**51**	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	**100**	0.50	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	**3500**	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	99.2		% Recovery	EPA 8260B	4/16/2005

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 43288
Date : 4/20/2005

Project Name : **421 SANTA ROSA**
Project Number : **AB021C**

Sample : **MW-6** Matrix : Water Lab Number : 43288-03
Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	**74**	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	97.9		% Recovery	EPA 8260B	4/16/2005

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 43288

Date : 4/20/2005

Project Name : **421 SANTA ROSA**

Project Number : **AB021C**

Sample : **MW-7** Matrix : Water Lab Number : 43288-04

Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	**1.7**	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	99.9		% Recovery	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	97.6		% Recovery	EPA 8260B	4/16/2005

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 43288

Date : 4/20/2005

Project Name : **421 SANTA ROSA**

Project Number : **AB021C**

Sample : **MW-8** Matrix : Water Lab Number : 43288-01

Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/15/2005
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	4/15/2005
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/15/2005
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	4/15/2005
Methyl-t-butyl ether (MTBE)	**5.6**	0.50	ug/L	EPA 8260B	4/15/2005
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	4/15/2005
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	4/15/2005
4-Bromofluorobenzene (Surr)	97.5		% Recovery	EPA 8260B	4/15/2005

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 43288
Date : 4/20/2005

Project Name : **421 SANTA ROSA**
Project Number : **AB021C**

Sample : **MW-9** Matrix : Water Lab Number : 43288-02
Sample Date :4/13/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	**13**	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	99.6		% Recovery	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	97.1		% Recovery	EPA 8260B	4/16/2005

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 43288

Date : 4/20/2005

QC Report : Method Blank Data

Project Name : **421 SANTA ROSA**

Project Number : **AB021C**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
Toluene	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	101		%	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	99.3		%	EPA 8260B	4/16/2005
Benzene	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
Toluene	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	4/16/2005
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	4/16/2005
Toluene - d8 (Surr)	99.9		%	EPA 8260B	4/16/2005
4-Bromofluorobenzene (Surr)	96.9		%	EPA 8260B	4/16/2005
Dibromofluoromethane (Surr)	100		%	EPA 8260B	4/16/2005
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	4/16/2005
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	4/19/2005
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	4/19/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 43288

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 4/20/2005

Project Name : **421 SANTA ROSA**

Project Number : **AB021C**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	43273-02	<0.50	40.0	40.0	36.4	35.0	ug/L	EPA 8260B	4/15/05	91.1	87.4	4.06	70-130	25
Toluene	43273-02	<0.50	40.0	40.0	38.4	37.0	ug/L	EPA 8260B	4/15/05	96.1	92.5	3.84	70-130	25
Tert-Butanol	43273-02	12	200	200	194	196	ug/L	EPA 8260B	4/15/05	91.2	92.1	1.02	70-130	25
Methyl-t-Butyl Ether	43273-02	<0.50	40.0	40.0	39.4	39.4	ug/L	EPA 8260B	4/15/05	98.5	98.4	0.0806	70-130	25
Benzene	43277-01	<0.50	40.0	40.0	40.2	39.2	ug/L	EPA 8260B	4/16/05	101	98.1	2.50	70-130	25
Toluene	43277-01	<0.50	40.0	40.0	41.2	39.7	ug/L	EPA 8260B	4/16/05	103	99.2	3.81	70-130	25
Tert-Butanol	43277-01	<5.0	200	200	196	197	ug/L	EPA 8260B	4/16/05	97.8	98.6	0.802	70-130	25
Methyl-t-Butyl Ether	43277-01	<0.50	40.0	40.0	44.2	43.6	ug/L	EPA 8260B	4/16/05	110	109	1.48	70-130	25
Benzene	43296-07	<0.50	40.0	40.0	40.2	39.0	ug/L	EPA 8260B	4/19/05	100	97.6	2.93	70-130	25
Toluene	43296-07	<0.50	40.0	40.0	40.7	39.6	ug/L	EPA 8260B	4/19/05	102	98.9	2.73	70-130	25
Tert-Butanol	43296-07	<5.0	200	200	190	190	ug/L	EPA 8260B	4/19/05	95.1	94.8	0.400	70-130	25
Methyl-t-Butyl Ether	43296-07	<0.50	40.0	40.0	37.1	37.4	ug/L	EPA 8260B	4/19/05	92.8	93.4	0.732	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 43288

Date : 4/20/2005

QC Report : Laboratory Control Sample (LCS)

Project Name : **421 SANTA ROSA**

Project Number : **AB021C**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	4/15/05	93.2	70-130
Toluene	40.0	ug/L	EPA 8260B	4/15/05	97.8	70-130
Tert-Butanol	200	ug/L	EPA 8260B	4/15/05	93.4	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	4/15/05	106	70-130
Benzene	40.0	ug/L	EPA 8260B	4/16/05	96.4	70-130
Toluene	40.0	ug/L	EPA 8260B	4/16/05	101	70-130
Tert-Butanol	200	ug/L	EPA 8260B	4/16/05	96.2	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	4/16/05	109	70-130
Benzene	40.0	ug/L	EPA 8260B	4/19/05	99.5	70-130
Toluene	40.0	ug/L	EPA 8260B	4/19/05	101	70-130
Tert-Butanol	200	ug/L	EPA 8260B	4/19/05	93.8	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	4/19/05	95.4	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 43288 Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Jim Ho

Company/Address: Cleanwater Group 229 Fourth Ave Pt. Richmond, CA

Phone No.: (510) 307-9143 FAX No.: (510) 232-2823

Project Number: A3021C P.O. No:

Project Name: 421 Santa Rosa

Project Address: 421 Santa Rosa Ave Santa Rosa, CA

California EDF Report? [X] Yes [ ] No

Recommended but not mandatory to complete this section:

Sampling Company Log Code: CWGO

Global ID: T0609700058 1

EDF Deliverable To (Email Address): JHo@cleanwatergroup.com

Sampler Signature: Jim Ho / Berry

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
MW-8	4/13/05	1300	3		X				X						X									1wk	-01
MW-9		1330																							-02
MW-6		1400																							-03
MW-7		1430																							-04
MW-5		1500																							-05
MW-4		1530																							-06
MW-2A		1600																							-07
MW-1A		1630	6																						-08

	Date	Time		
Relinquished by: Jim Ho / Berry	4/14/05	1630	Received by:	
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date 041505	Time 1630	Received by Laboratory: Kiff Analytical	

Remarks: MW-1A for analysis for 1-2DCA
EXTRA 3 VO's

Bill to:

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9